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ABSTRACT

The effect of commercial coaching on Scholastic Aptitude Test (SAT) scores was analyzed, using 1974-1977 test results of 2,500 non-coached students and 1,568 enrollees in two coaching schools. (The Stanley H. Kaplan Educational Center, Inc., and the Test Preparation Center, Inc.). Multiple regression analysis was used to control for student demographic variables. Separate analyses were conducted for the two schools, for students who were coached before their first SAT, or between their first and second SAT administrations. Coaching was effective at the Kaplan School, where students tended to be underachievers--i.e. they scored lower on standardized examinations than would have been predicted by personal and demographic variables. Kaplan students who were not underachievers also benefited from coaching; however, this finding was based on a limited sample, covering only a single administration of the verbal section of the SAT. Coaching at the Test Preparation Center was not found to be effective. However, these students were not underachievers. Results of this study were inconclusive, partly because of the non-experimental design. It was impossible to consider all possible effects of self-selection--for example, the possibility that students who chose to enroll in coaching schools were especially motivated to achieve higher scores. (Author/CP)

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EFFECTS OF COACHING ON STANDARDIZED ADMISSION EXAMINATIONS

REVISED STATISTICAL ANALYSES OF DATA GATHERED BY BOSTON REGIONAL OFFICE OF THE FEDERAL TRADE COMMISSION

FEDERAL TRADE COMMISSION

BUREAU OF CONSUMER PROTECTION

MARCH 1979

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NOTE: THE FINDINGS AND CONCLUSIONS IN THIS STUDY ARE THOSE OF MEMBERS OF THE STAFF OF THE FEDERAL TRADE COMMISSION AND ARE NOT NECESSARILY THOSE OF THE COMMISSION OR OF ANY INDIVIDUAL COMMISSIONER.

EXECUTIVE SUMMARY

This study contains an analysis of the impact on Scholastic Aptitude Test (SAT) scores of coaching at two commercial coaching schools. Data were obtained from the Educational Testing Service (ETS) and from the coaching schools, enabling a non-experimental study to be conducted.

Separate analyses were executed for the two schools for students who were coached before their first SAT exam and for students who were coached between their first and second exams. It was found that coaching was effective at one of the two schools, contributing on the average approximately 25 points to students' scores on both the verbal and math SAT exams.

The students who attended the effective school (School A) tended to be underachievers on standardized exams, i.e., they scored lower on standardized exams than would have been predicted given their personal and demographic characteristics (including such factors as grades in school and class rank). If this underachieving was random rather than systematic, the results showing the benefits of the coaching received at School A might have been overstated. Analysis was conducted, however, showing that the underachievement by the students was not due to chance, and probably would have continued in the absence of coaching.

Some evidence has also been presented in the report showing that students who were not underachievers on standardized tests could also be helped by coaching at School A. Because data concerning this was only available for one test, the issue of the effectiveness of School A for students who are not underachievers on standardized exams could not be resolved with a high degree of confidence in this study.

While the results indicated that coaching at the second school was not effective, it should be pointed out that the students at this school were not underachievers. Thus if only underachievers can be helped, it is possible that coaching at the second school would be effective for such students.

ANALYSIS OF THE IMPACT OF COACHING

The purpose of this study is to estimate statistically the impact of commercial coaching on SAT scores. There are two major approaches which can be used. The first is to conduct an experiment. The second is to treat non-experimental data as if they came from an experiment.

Conducting a coaching experiment requires defining two comparable groups of students. Members of the experimental group would be enrolled in coaching courses; members of the control group would not receive any coaching. The purest method of obtaining these two groups would be to deny access to commercial coaching on a random basis to one-half of the potential coaching school enrollees. If the experimental and control groups were thus formed, then greater than chance SAT score differences between the groups could be attributed to coaching.

The second approach, analyzing an existing situation, requires the identification of students who voluntarily enroll in coaching courses and students who choose not to enroll in such courses. These two groups correspond to the experimental and control groups of the first approach. If the enrolled and non-enrolled groups are in all ways similar, then SAT score differences between the groups can be attributed to coaching.

Both approaches have advantages and shortcomings. The experimental approach is preferable because it avoids problems of self-selection into coaching schools and can assure that the uncoached students are, in fact, uncoached. Self-selection can be important if students whose first SAT or PSAT attempt produces unexpectedly low scores are more likely to obtain commercial coaching than students whose first exam score more closely matches their expectations. If this occurs, score gains which are attributed to coaching may contain a self-selection component which may lead to an overestimate of coaching benefits.

Conversely, a non-experimental control group may lead to an underestimate of coaching benefits. That is, the uncoached students may in fact have received some form of coaching other than formal enrollment in a commercial coaching course. They may, for example, have attended a course offered by a school in the not-for-profit segment of the industry or have engaged in extensive self-preparation. These unmonitored efforts, if they occur and if they are effective, would tend to increase the average test scores of the "uncoached" students. These increased scores, containing a component properly attributable to coaching, would tend to shrink the apparent benefit from commercial coaching.

On purely theoretical grounds the experimental approach is preferable. However, the experimental approach is expensive, time-consuming, and may present ethical problems (as it would require denying access to commercial coaching to students who want it). As a result, this study uses a nonexperimental approach to estimating the effects of coaching on SAT scores.

STUDY DESIGN

The major steps undertaken in the study were as follows:

1. Definition of sample group of SAT takers;
2. Separation of coaching school enrollees from nonenrollees;
3. Collection of data on demographic and personal characteristics for the students in the sample;
4. Segregation of the data into subsamples;
5. Comparison of SAT scores of coached and uncoached students.

Each of these steps will be described below.

Definition of Sample of SAT Takers

The sample definition began with coaching school enrollment lists obtained from coaching schools. These lists contained students' names, addresses, and course dates covering the testing years 1974-1975, 1975-1976, and 1976-1977. This three-year time period was determined by two factors. First, the records prior to 1974 were incomplete,

illegible, or missing. Second, it was felt that a three-year time period would be desirable to minimize any influence from the long-term gradual decline in average SAT scores that has been occurring in recent years.

Although data were obtained from three coaching schools in the New York metropolitan area, the data from one of these were eliminated in the analysis due to the very small number of students who were coached at this school.

Inspection of the student addresses allowed definition of the primary market areas served by the coaching schools in this metropolitan area. These market areas are compact, contiguous areas which generate most of the coaching schools' enrollment. At the three-digit level of Zip Code geography, the SAT market area for metropolitan New York was: 064-069 (Connecticut), 070-080 (New Jersey), 085-089 (New Jersey), and 100-127 (New York).

Given these geographic market areas, CEEB and ETS then provided the test records for all persons located in these areas who attempted the SAT during the three-year period investigated. This large group of individuals included both coached and uncoached students.

Separation of Enrollees from Nonenrollees

The separation of enrollees from nonenrollees began with the identification of coaching school enrollees within

the group identified from the CEEB and ETS records for the study period. This task consisted of taking a coaching school enrollee's name and address and searching the testing data file until that person's testing history was found. The goal of this task was to establish for each person a compact data set containing the person's testing history, coaching history if any, and relevant biographical information (obtained from the ETS records).

Testing histories were identified for 1,568 coaching school enrollees (from the two schools). Approximately 600 individuals identified from the coaching school list did not match up with the ETS provided file, and these individuals were dropped from the later analysis. The failure to locate testing histories for all enrollees may be attributable to several factors. First, some coached individuals may have failed subsequently to take a standardized admission examination. Second, these individuals may have taken the exam, but at a location outside the defined market area or at a time period not included in the study. Finally, they may have taken another standardized examination such as the ACT.

A sample of uncoached persons was felt to be the most reasonable and efficient way of establishing a control group. Approximately 2,500 uncoached students were chosen from the ETS provided data file. These students were selected using a systematic sampling procedure with a random start.

This sampling methodology was implemented by selecting an integer between 1 and 150 from a table of random digits. The data record corresponding to that number was selected, plus every succeeding 150th data record, yielding a sample of 2,597 uncoached students.

Collection of Data on Demographic and Personal Characteristics

Because of the nonexperimental design of the study there was no reason to expect the coached and uncoached groups to have similar demographic and personal characteristics. If differences in such characteristics were not controlled in the statistical analysis, then any differences in SAT scores between the coached and uncoached students could not be attributed with any confidence to coaching.

Data on demographic and personal characteristics were obtained from Student Demographic Questionnaires (SDQ) voluntarily completed by the students at the time the SAT was taken. In addition, some data were obtained directly from the SAT application and exam. These data allowed a comparison of the profiles of the coached and uncoached students. Analysis of the data revealed that the two groups did in fact differ in characteristics which could possibly explain differences in SAT performance. For example, coached students, on average, have higher PSAT scores than noncoached students. They tend to receive higher grades in their

high school English and Math courses than noncoached students, and a larger percentage of the coached group attend nonpublic schools. Profiles of the two groups are presented in Table 1.

These findings made it imperative that the demographic characteristics of the SAT takers be controlled in the analysis. All students who failed to respond to the demographic questionnaire were deleted from the study leaving a sample size of 2,741 students (1,738 uncoached and 1,003 coached).

Segregation of the data into Subsamples

The next step was the segregation of the data into subsamples. It was felt that the SAT examinations administered at different times might yield different distributions of scores, making it preferable to analyze the impact of coaching for each separate exam independently wherever possible. Over the three-year time period there were four test dates for which there were sufficient numbers of students in the sample to enable separate analysis. Two of these test dates were in April (1975 and 1976) and two were in November (1975 and 1976). It turned out that almost all the students taking the April examinations were juniors and were taking the SAT for the first time. To make the group as homogenous as possible, those few students who were not juniors or who were not taking the exam for the first time were deleted from the sample. The same methodology was used

TABLE 1

COMPARISON OF DEMOGRAPHIC PROFILES OF COACHED AND UNCOACHED STUDENTS

(page one)

CLASS RANK**	Coached	Uncoached
Top 10%	30.9%	21.0%
2nd 10%	26.2%	22.7%
2nd 20%	24.1%	28.0%
3rd 20%	17.3%	25.8%
4th 20%	1.5%	2.0%
Bottom 20%	0.0%	0.5%
	100.0% (n=926)	100.0% (n=1627)
PARENTAL INCOME**		
Less than $12,000 per year	15.7%	23.3%
Between $12,000 and $17,999	15.6%	25.9%
Between $18,000 and $23,999	16.2%	20.5%
Between $24,000 and $29,999	11.3%	13.0%
$30,000 or more	41.2%	17.2%
	100.0% (n=770)	100.0% (n=1395)

** Coached and uncoached groups are significantly different at the .01 level.

TABLE 1

COMPARISON OF DEMOGRAPHIC PROFILES OF COACHED AND UNCOACHED STUDENTS

(page two)

SEX	Coached	Uncoached
Male	52.5%	50.6%
Female	47.5%	49.4%
	100.0% (n=1002)	100.0% (n=1735)
ETHNIC BACKGROUND**		
White	89.7%	88.7%
Black	3.7%	6.9%
Other Minorities	6.6%	4.4%
	100.0% (n=925)	100.0% (n=1655)
HIGH SCHOOL TYPE**		
Public	55.3%	75.4%
Other than Public	44.7%	24.6%
	100.0% (n=988)	100.0% (n=1706)

** Coached and uncoached groups are significantly different at the .01 level.

TABLE 1

COMPARISON OF DEMOGRAPHIC PROFILES OF COACHED AND UNCOACHED STUDENTS

(page three)

LATEST ENGLISH GRADE**	Coached	Uncoached
A (90% - 100%)	55.3%	35.5%
B (80% - 89%)	37.6%	50.3%
C (70% - 79%)	6.8%	13.3%
D (60% - 69%)	0.4%	0.8%
F (59% or lower)	0.0%	0.1%
	100.0% (n=932)	100.0% (n=1671)
LATEST MATH GRADE**		
A (90% - 100%)	48.3%	29.6%
B (80% - 89%)	34.2%	37.8%
C (70% - 79%)	14.5%	25.3%
D (60% - 69%)	2.8%	6.5%
F (59% or lower)	0.2%	0.8%
	100.0% (n=925)	100.0% (n=1657)

** Coached and uncoached groups are significantly different at the .01 level.

TABLE 1

COMPARISON OF DEMOGRAPHIC PROFILES OF COACHED AND UNCOACHED STUDENTS

(page four)

EXPECTED YEARS OF ENGLISH	Coached	Uncoached
0	0.2%	0.4%
1	0.4%	0.2%
2	0.4%	0.8%
3	3.6%	3.9%
4	88.1%	87.3%
5	7.2%	7.4%
	100.0% (n=966)	100.0% (n=1687)
EXPECTED YEARS OF MATH**		
0	0.2%	0.2%
1	0.2%	1.5%
2	3.2%	8.7%
3	33.8%	32.6%
4	50.4%	46.3%
5	12.2%	10.7%
	100.0% (n=970)	100.0% (n=1684)

** Coached and uncoached groups are significantly different at the .01 level.

for the November test dates, with the result that the students in those two subsamples were seniors taking the SAT for the second time.

In addition to the evaluation of the results for individual test administrations, it was felt that the data should be pooled for all test periods available. The pooled data were separated into first time SAT takers and second time SAT takers.

To summarize, the 6 subsamples created are as follows:

1. High school juniors taking the SAT for the first time in April 1975 (sample size = 683; 76 coached students and 607 uncoached students).

2. High school juniors taking the SAT for the first time in April 1976 (sample size = 864; 247 coached and 617 uncoached).

3. High school seniors taking the SAT for the second time in November 1975 (sample size = 494; 98 coached and 396 uncoached).

4. High school seniors taking the SAT for the second time in November 1976 (sample size = 564; 177 coached and 387 uncoached).

5. All high school students taking the SAT for the first time on any of the test dates over the 3 year period (sample size = 2180; 417 coached and 1763 uncoached).

6. All high school students taking the SAT for the second time on any of the test dates over the 3 year period (sample size = 1,583; 316 coached and 1267 uncoached).

Comparison of Coached and Uncoached Groups

The technique used to estimate the impact of coaching on SAT scores is multiple regression analysis. The major advantage of this technique is its ability to analyze the impact of one variable on another variable while controlling approximately for (holding constant) the effects of several other factors. For example, the technique enables the researcher to examine the impact of coaching on SAT score while controlling approximately for differences in such factors as class rank, family income, and sex. The controlling variables used in the analysis included the following:

1. Rank in high school class;
2. Sex;
3. Grade in last English (for verbal SAT) or Math (for math SAT) course;
4. Parental income;
5. High school type--public or nonpublic (many of the nonpublic schools in the market area are parochial schools);
6. Years of English/Math expected to be taken by high school graduation;
7. Score on PSAT (a preliminary exam taken before the SAT);
8. Number of PSAT's taken;
9. Elapsed time from first PSAT to SAT;
10. Coached or noncoached.

In addition, a time trend variable was included in the regression analysis for subsamples five and six to account for the gradual decline in average SAT scores during the three year time period examined. More complete definitions of each of the variables are presented in Table 2.

Several issues were examined before the data analysis was conducted. The first issue investigated was whether or not coaching had different impacts on "good" and "poor" students. If coaching did benefit these groups of students differently, then it would be necessary to separate the sample into groups (such as below average, average, and above average) and test for the effect of coaching separately for each group. (Alternatively, this could be accomplished by the use of interaction terms in the regression equations.)

To test for the presence of differential coaching impacts, the sample of first time SAT takers was separated into three subgroups--those scoring in the bottom one-third, middle one-third, and top one-third on the PSAT exam. The results of this analysis indicated that no substantial interaction effects were present. Therefore, it was decided that the analysis would not have to take into account the effects of possible interaction between coaching and PSAT score.

Table Two

VARIBLES USED IN REGRESSION ANALYSES

Variable Name	Description
COACH1	A categorical variable; 1=Coached at School A, 0=Not coached at School A.
COACH2	A categorical variable; 1=Coached at School B, 0=Not coached at School B.
GENG	Latest grade in English. This variable represents the last grade in English received prior to the student filling out the descriptive questionnaire. The original questionnaire item was categorical in nature, where students reported which percentage interval their grade fell in, e.g., 80%-89%. The data were recoded to create an interval variable, using the value of the mid-point of the interval. For the open-ended category, 59% or below, 50 was used.
GMAT	Latest grade in Math. This variable is analogous to GENG.
HSTYP	A categorical variable representing type of high school attended; 0=Public 1=Other than public.
INCOM	This variable represents parental income. The original variable was categorical in nature, where students selected a salary range within which their parents income fell, e.g., between $12,000 and $13,499 a year. This variable was recoded in thousands to create an interval variable by using the mid points of each category. For the open-ended response, $30,000 or more per year, 35 was used.
JUNIOR	A categorical variable indicating the year of high school the student was in when the test was taken: 1-Junior, 0=Not a Junior.

Variable Name	Description
NEWNPSAT	A categorical variable representing the number of PSAT's taken prior to the first SAT: 0=1 PSAT taken, 1=2 PSAT's taken.
PSM1	This is a continuous variable representing the student's math score on the first PSAT.
PSV1	This is a continuous variable representing the student's verbal score on the first PSAT.
RACE1	A categorical variable related to ethnic background of the student: 1-All minorities other than black, 0=Either black or white.
RACE2	A categorical variable related to ethnic background of the student: 1=Black, 0=Not Black.
RANK	This variable relates to the student's high school class rank. This was originally a categorical variable. Students stated whether they were in the top-tenth, second-tenth, second, third, fourth, or bottom-fifth of their class. This variable was recoded to create an interval variable based on a 100 point scale.
SEX1	A categorical variable indicating sex reported (at the time of the first SAT): 0=Male, 1=Female.
SEX2	A categorical variable indicating the sex reported (at the time of the second SAT): 0=Male, 1=Female.
SOPH	A categorical variable indicating the student's year in high school at the time of the test: 1=Sophomore, 0=Not a Sophomore.
SVERB1	This is a continuous variable representing the student's verbal score on the first SAT.
SMATH1	This is a continuous variable representing the student's math score on the first SAT.

Variable Name	Description
SVERB2	This is a continuous variable representing the student's verbal score on the second SAT.
SMATH2	This is a continuous variable representing the student's math score on the second SAT.
TIME9	This is a continuous variable representing the number of months elapsed between the test being predicted and the test used in the predicting equation.
TIME10	This is a continuous trend variable representing the number of months between the earliest date of the test being predicted and the test date of each student.
TMAT	This is a continuous variable representing the number of years of math-related courses the student expected to complete by the end of high school.
YENG	This is a continuous variable representing the number of years of English-related courses the student expected to complete prior to the end of high school.

Source: Student Demographic Questionnaires and applications for the exams. It should be noted that for some students the data were collected when they took their first exam and for other students the data were collected when they took their second exam.

A second issue deserving consideration was the question whether or not there was a relationship between coached versus uncoached students and taking the SAT once or twice. If it is assumed that students who are coached before they take the SAT for the first time are serious and do not plan to take it a second time, while those who are not coached are not as serious because they do plan to take it a second time, then higher scores obtained by coached students which may be attributed to the coaching may be due instead to the difference in how serious the students are. To determine if this issue was a valid concern, a comparison was made between the percentage of students coached (before the first exam) who took the SAT twice and the percentage of uncoached students who took the exam twice. The results of this analysis indicated that the students who were coached were more likely than their uncoached counterparts to take the exam a second time. This finding would seem to indicate that the issue was not a cause for concern and that no adjustments needed to be made in the analysis.

RESULTS

This section will present the results of the regression analysis, following the step-by-step procedures that were utilized during the study. Tables showing the major findings are presented in the text, with the detailed regression results presented in appendices. First, the overall findings of the study will be presented. Then adjustments to the data are

presented to account for possible biases in these results.

Overall Results

To review the analysis procedure, for each of the sub-samples under investigation, a regression analysis was conducted predicting SAT score using a number of predictor variables including PSAT (or first SAT for predictions of the second SAT taken), demographic variables and two variables to indicate whether or not coaching was received. Separate regressions were run for the verbal and math SAT examinations. This analysis enabled the evaluation of the effect of each of the two coaching schools for each of the two SAT exams (verbal and math) for each of the six subsamples.

Table 3 presents the findings related to the overall impact of coaching. The detailed regression results relating to Table 3 are presented in Appendix A. Included in the Table are data on the mean number of points on each exam contributed by each coaching school for each sub-sample. Also included in the table are confidence intervals representing the mean score plus or minus two standard errors. This represents approximately a 95% confidence interval -- i.e., these intervals are created by a method that has 95% probability of surrounding the true mean.

TABLE 3

OVERALL IMPACT OF COACHING

Mean Number of Points (and Confidence Interval)
Contributed by Coaching School

		School A		School B	
	Subsample*	Verbal SAT	Math SAT	Verbal SAT	Math SAT
1.	1st SAT 4/75 (n=476)	18.0 (2 -34)	17.1 (0 - 34)	**	**
2.	1st SAT 4/76 (n=658)	44.5 (33 - 57)	26.5 (14 - 39)	3.5 (-10 to 17)	.2 (-15 to 15)
3.	2nd SAT 11/75 (n=359)	26.9 (11 - 43)	22.4 (5 - 40)	0.5 (-25 to 26)	27.9 (0 - 56)
4.	2nd SAT 11/76 (n=438)	25.4 (14 - 36)	30.7 (19 - 42)	9.5 (-11 to 30)	2.0 (-20 to 24)
5.	1st SAT - Pooled Time Periods (n=1578)	29.7 (21 - 39)	19.2 (10 - 28)	-1.8 (-13 to 10)	5.4 (-6 to 17)
6.	2nd SAT - Pooled Time Periods (n=1176)	27.2 (19 - 35)	28.4 (20 - 37)	5.5 (-9 to 20)	3.0 (-12 to 18)

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* The sample sizes reported here vary from those reported in the methodology section of the text because some students did not respond to one or more items on the Student Demographic Questionnaire and were therefore dropped from this analysis.

** No one taking this SAT exam received coaching at School B.

Using the data for first-time SAT takers pooled across all the exam dates over the three-year period (sub-sample 5), it can be seen that coaching at School A contributes an average of 29.7 points to students' verbal SAT scores and 19.2 points to their math SAT sccres. These figures repesent the average or mean number of points attributable to this coaching school. The confidence intervals are 21 to 39 points for the verbal SAT and 10 to 28 points for the math SAT.

Using the same sub-sample and analyzing the results for School B, it can be seen that the mean number of points attributable to coaching is minus 1.8 points for the verbal SAT, and +5.4 points for the math SAT. The confidence interval for the verbal SAT is from -13 to +10 points and from -6 to +17 points on the math SAT. Thus, it is easily seen that the impact of coaching at School B is very close to zero points (compared to almost 30 points on the verbal and 20 points on the math SAT for School A).

An examination of the findings for the other five sub-samples shows that the results described for sub-sample 5 also hold true across each of the other five sub-samples. In fact, the results are very consistent for each of the two schools and for both the verbal and math exams within each school. Using a two-tailed test (the more conservative measure), all of the results for School A are statistically significant at a level of .05 or better (meaning that there are five chances or less in 100 that one would be wrong in concluding that coaching at School A contributes to students' SAT scores).

For School B, the only result which is statistically significant at the .05 level is for the math SAT on the November '75 test (sub-sample 3). The overall results for School B, however, indicate that coaching at this school does not contribute to increasing one's SAT score.

These findings confirm the decision made previously to analyze the effects of each of the two schools separetely. The curricula for the two schools were substantially different with School A offering many more coaching sessions.

Before concluding that School A "works" and School B does not, further analysis must be conducted. As indicated previously, it is possible that self-selection is responsible

for the apparent effectiveness of coaching rather than the coaching itself. If, for example, the students who choose to go to a coaching school represent those individuals who scored lower than they expected on the SAT (given their demographic and other personal characteristics including grades and rank in high school class), the improvement in their score after coaching may not have been due to the coaching itself. Instead, it is possible that the increase in their score is a reflection of their performing on the second exam at a level which is more commensurate with their actual abilities.

To illustrate this point assume that a student would be expected to score about 500 on the SAT verbal exam. If this student took the exam a number of times, he would not score exactly 500 each time, but would, instead, sometimes score somewhat lower and sometimes somewhat higher. If this student expected to score about 500 but actually scored less than 500, he might decide to go to a coaching school. When he took the exam again, he might receive a score of 500 or even greater, tempting one to conclude that his increase in score was attributable to coaching when in fact it could have occurred without coaching. Thus it was necessary to re-examine the data to see if this potential bias existed, and if it did to control for it.

Analysis of Potential Self-Selection Bias

In this section, the methodology used to test for the impact of potential self-selection bias will be described, and the results will be reported. A predicted exam score for each student was estimated and compared with the actual score the student received. If self-selection for coaching were present, the results would show that, on average, students getting coached before their first SAT (and students getting coached before their second SAT) would score lower on their PSAT (first SAT) than would be predicted based on their class rank and other demographic variables.

To test for these effects (in sub-samples 1, 2 and 5), an analysis comparing actual PSAT with predicted PSAT was conducted for coached and noncoached students. The first step was to conduct a regression analysis predicting PSAT for all students, regardless of whether or not they were later coached. The regression results are presented in Appendix B. Then using the results of this regression analysis, a predicted PSAT score was computed for each individual student. This score was then compared with the student's actual score to determine the deviation from the expected score. After this deviation was computed for every student, a mean deviation score was computed for coached students and for uncoached students. If self-selection was present, the mean deviation score for the coached students would be significantly lower than the score for the uncoached students.

These procedures were then replicated (for sub-samples 3, 4 and 6), predicting the first SAT score instead of the PSAT score. These results are also presented in Appendix B. Again, if self-selection were present, the mean deviation score for students coached after the first SAT would be significantly different from the mean score for uncoached students. The results of the analysis for both the PSAT and SAT exams are presented in Table 4. (It should be noted that student expectations may be based partly on variables other than those included in the regression analysis. To the extent that this is true, the estimation of students' expectations may over or understate their actual expectations. As an example, the variables analyzed here did not include any measures of students' personality characteristics, and there is no way of knowing how such factors are related to students' expectations).

The first numbers presented in Table 4 describe the mean deviation scores on the verbal PSAT exam pooled for all test dates during the three year period investigated. The score for the coached group is -1.43, indicating that on the average the coached group scored almost 1 1/2 points below what would have been expected given their personal and demographic characteristics. The uncoached group, on the other hand, scored slightly higher (.32 points) than would have been expected given their personal and demographic characteristics.

Table 4

Analysis of Self-Selection

Verbal PSAT	Mean Deviation Score*
Coached Group	- 1.43
Uncoached Group	+ .32
Math PSAT	
Coached Group	- 1.05
Uncoached Group	+ .23
Verbal SAT	
Coached Group	- 7.9
Uncoached Group	+ 5.3
Math SAT	
Coached Group	- 9.0
Uncoached Group	+ 4.6

* Differences between the coached and uncoached groups are statistically significant at the .05 level or better for each comparison.

The difference between the two groups, 1.75 points, should be viewed in the context of PSAT scores which can range from 20 to 80 points. This difference is statistically significant at the .05 level.

The results for the math PSAT are very similar to those on the verbal exam. The coached group scored approximately 1 point below what would have been expected, and the uncoached group scored very slightly better than expected. Again, the difference between the two groups is statistically significant at the .05 level, leading one to conclude that self-selection was present.

Similar results were obtained for both the verbal SAT and math SAT (for second time takers, i.e., sub-sample 6). The coached group scored lower than expected (by 8 and 9 points on the verbal and math exams respectively on a scale of 200 t0 800 points), and the uncoached group scored somewhat higher than expected (about 5 points). Once again the differences between the coached and uncoached groups were statistically significant at the .05 level.

These findings would seem to cast doubt on the results reported above relating to the effect of coaching on SAT scores. The increase in SAT scores previously attributed to the impact of Coaching School A may instead be due, in part or in whole, to the effects of self-selection. Ignoring this potential self-selection bias could lead one to overstate

the effects of coaching. To prevent this problem, the data were reexamined, taking the self-selection into account. The next section of the report describes this analysis.

Adjusting for Self-Selection

To evaluate the impact of coaching upon SAT scores adjusting for the effects of self selection, a procedure analagous to that used in developing Table 3 above was followed. For each of the six sub-samples, a regression analysis was conducted to determine the number of points on verbal and on math SAT exams that can be attributed to the coaching at each school. The difference between this analysis and that presented above is that PSAT scores were not included as one of the variables used to predict the first SAT score and the first SAT score is not used to predict the second SAT score. The reason these are not included in this analysis is to eliminate the effect of the underachievement on the PSAT (for those getting coached before taking the first SAT exam) or first SAT exam (for those getting coached before taking the second SAT exam). If the underachievement is due to chance, this procedure will yield results which are more appropriate to use in evaluating the effects of coaching.

Table 5 presents the findings of this analysis (Appendix C contains the detailed regressions). Examining the findings for the first SAT pooled across all the exam dates over the

TABLE 5

IMPACT OF COACHING ADJUSTING FOR SELF-SELECTION

Mean Number of Points (and Confidence Interval)
Contributed by Coaching School

		School A		School B	
	Subsample	Verbal SAT	Math SAT	Verbal SAT	Math SAT
1.	1st SAT 4/75 (n=476)	-6.1 (-32 to 20)	-1.4 (-27 to 24)	*	*
2.	1st SAT 4/76 (n=658)	26.8 (8 - 45)	7.5 (-11 to 26)	.8 (-20 to 22)	8.8 (-13 to 30)
3.	2nd SAT 11/75 (n=359)	27.9 (1 - 55)	6.7 (-20 to 34)	8.3 (-36 to 53)	32.1 (-11 to 75)
4.	2nd SAT 11/76 (n=438)	10.3 (-9 to 30)	19.4 (0 - 39)	-1.5 (-38 to 35)	3.2 (-34 to 41)
5.	1st SAT - Pooled Time Periods (n=1578)	11.5 (-2 to 25)	5.5 (-8 to 19)	-2.3 (-20 to 15)	13.4 (-4 to 31)
6.	2nd SAT - Pooled Time Periods (n=1176)	16.2 (2 - 31)	16.6 (2-31)	-3.9 (-29 to 21)	-4.4 (-29 to 21)

* No one taking this SAT exam received coaching at School B.

three year period, it can be seen that the effects of coaching on both the verbal and math SAT exams are much smaller than those reported in Table 3. For example, the mean number of points attributable to coaching at School A on the verbal SAT is only 11.5 points compared to 29.7 points without the adjustment for self-selection, and the mean number of points on the math exam is 5.5 points compared to 19.2 points. More importantly, the results are no longer statistically significant at the .05 level.

The findings for the effects of coaching on the second SAT pooled across all the test dates are somewhat different. For School A the number of points attributable to coaching are somewhat lower than those reported previously (16.2 and 16.6 compared to 27.2 and 28.4 on the verbal and math SAT's, respectively). These results are still statistically significant, meaning that even with the adjustment for self-selection School A has a positive effect on both exams. The results for School B are lower than those reported in Table 3, and are still not statistically significant.

An examination of the results for each of the first four subsamples representing the four different test dates reveals mixed results for School A. For the verbal SAT exam, coaching has a statistically significant effect for only two of the four test periods. For the math SAT School A is only effective for one of the four exams. If one believes that coaching must be consistently effective before

one can conclude that coaching schools work, one can not state that coaching at School A works (at least after taking into account self-selection).

Before taking into account the effects of self-selection, the results indicated that coaching at school B did not have a statistically significant effect. After taking self-selection into account, the conclusion remains the same, as the data in Table 5 show that coaching is ineffective for each of the time periods examined.

The question that has not been answered is whether or not the scores for students who are coached would have increased even if they had not received coaching. For example, it could be argued that a student who scores 20 points below what would be expected (given his class rank and other personal and demographic characteristics) would continue to score 20 points below the expected level in the absence of coaching because this difference is not due to chance, but rather to the student's inability to perform well on standardized tests such as the SAT. If this latter explanation is in fact true, then coaching may be responsible for the elimination of the negative deviation from the expected score. While there is no way to test for the validity of this argument for those taking the SAT for the first time, it can be tested for those who take the SAT for the second time.

An analysis can be conducted to determine whether the students getting coached between the first and second SAT exams scored lower than expected on the first SAT by chance. If the reason for the lower than expected score is chance, then an analysis of their PSAT scores should show no deviations from the expected values. If on the other hand the deviations from expected scores are not due to chance, then the analysis of the PSAT scores should also result in lower than expected scores. Moreover, one might expect that the deviations from the expected scores would be similar in relative magnitude. This latter result would indicate that students self-selecting coaching were underachievers on standardized tests, and would probably continue to be underachievers in the absence of coaching.

Table 6 presents the results of the analysis to determine if the deviation from expected score by coached students occurs consistently as opposed to randomly. The data in this table are for the PSAT and first SAT scores for those students who take the SAT a second time.* The numbers in the last two rows in the table are identical to those presented previously in Table 4 and are included here to enable comparison with the deviation scores on the PSAT exams.

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*/ It should be noted that the regressions used to estimate student expectations on the PSAT, presented in Appendix D, are based on a sample size somewhat smaller than that used to estimate student expectations for the first SAT. The reason for this is that PSAT scores were not available for all students in the sample.

TABLE 6

MEAN DEVIATION SCORES ON PSAT AND FIRST SAT FOR SECOND-TIME SAT TAKERS

(Pooled Across All Test Dates)

	Coached	Uncoached
Verbal PSAT	-1.5	+0.4
Math PSAT	-1.3	+0.4
First Verbal SAT	-7.9	+5.3
First Math SAT	-9.0	+4.6

NOTE: The differences between the coached and uncoached groups are statistically significant at the .05 level or better for each comparison.

The results in the table indicate that the students who received coaching before the second SAT were underachievers not only on their first SAT, but also on their PSAT exams. Moreover, after adjusting for the difference in the scales of the two exams, the amount of underachievement is about the same. The differences between the coached and uncoached students are statistically significant for all exams at a level of .05 or better. Thus it would appear that the mean deviation scores of the coached students are not due to chance, but are systematic, i.e., without coaching, underachievement would probably continue to occur. Based upon the above analysis, the findings concerning the effects of coaching presented in Table 3 are more appropriate than those presented in Table 5 which take self-selection into account.

CONCLUSIONS

On the basis of the above analysis, subject to all the caveats discussed, it can be concluded that coaching at School A has been effective in increasing both verbal and math SAT scores. An issue which still must be addressed, however, is whether the findings presented in Table 3 can be applied to all students, or only to those students who tend to underachieve on standardized tests.

To answer this question, the analysis of self-selection which was conducted above using the sample pooled across all test dates was replicated, examining each test date individually.

In addition, instead of analyzing the coaching schools together, they were examined independently. If self-selection was present at School A for some test dates but not for others, the impact of coaching on the two groups of students (underachievers and others) could be compared. This analysis of self-selection for each individual test date showed that self-selection was in effect for School A for each of the test dates and for both of the exams, with the sole exception of the November 1975 verbal exam. Table 3 has shown that coaching at School A was effective for this exam. This result indicates that coaching at School A can be effective for all students, not just for underachievers. It must be pointed out, however, that this finding is based upon a single test date, and only for the verbal SAT. Only 48 students coached at School A took this particular exam. As a result, caution must be used in interpreting this finding.

Even though it cannot be firmly concluded that coaching will work for everyone, the results of the study do show that coaching can be effective for those who do not score well on standardized tests. If large numbers of students were to obtain coaching because they felt it was effective, they might be very disappointed if in fact coaching really is only effective for underachievers.

While the results presented in Table 3 indicate that coaching at School B is not effective, it should be pointed out that the results of the self-selection analysis by

individual test date and school showed that self-selection was not generally present for School B. Thus if only under-achievers can be helped, it is possible that coaching at School B would be effective for such students. Alternatively, the differences between the effectiveness of School A and School B may be due to differences in the curriculum used by the two schools. Because self-selection is present for all but one test for one school on one date, this question cannot be resolved with much confidence in this study.

APPENDIX A

Regression Analyses to Measure the Effect of Coaching

Prediction of First Verbal SAT Score - Subsample 1

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* * * * * * * * * * * * * * * * * * * * * * * * MULTIPLE REGRESSION * * * * * * * * * * * * *          VARIABLE LIST  1
                                                                                                    REGRESSION LIST  1

DEPENDENT VARIABLE..     SVERB1     VERBAL SCORE -FIRST EXAM

VARIABLE(S) ENTERED ON STEP NUMBER  1..     PSV1      PSAT VERBAL SCORE
                                            RANK      HIGH SCHOOL CLASS RANK
                                            SEX1      SEX REPORTED AS FEMALE
                                            GENG      LATEST ENGLISH GRADE
                                            RACE1     OTHER MINORITY ETHNICS
                                            RACE2     BLACKS
                                            INCOM     PARENTS INCOME LEVEL
                                            HSTYP     PRIVATE HIGH SCHOOL
                                            COACH1    SCHOOL "AM INTERCEPT
                                            YENG      YEARS OF ENGLISH


MULTIPLE R              0.87287          ANALYSIS OF VARIANCE     DF      SUM OF SQUARES      MEAN SQUARE          F
R SQUARE                0.76050          REGRESSION               10.     3576957.28334       357695.72833       147.65534
ADJUSTED R SQUARE       0.75535          RESIDUAL                465.     1126464.56540       2422.50444
STANDARD ERROR         49.21894


---------- VARIABLES IN THE EQUATION ----------

VARIABLE            B          BETA     STD ERROR B          F

PSV1          1.073984        0.76915       0.28495      747.471
RANK          0.3587503       0.06156       0.17097        4.403
SEX1          7.811121        0.03922       4.67318        2.794
GENG          1.855057        0.13569       0.39117       22.489
RACE1     0.1228600-01        0.00003      11.30072        0.000
RACE2         1.882964        0.00928      14.60949        0.162
INCOM         0.6442854       0.06038       0.25786        6.243
HSTYP        -1.905961       -0.00856       5.15395        0.137
COACH1       18.00794         0.05455       7.91696        5.174
YENG         -4.137419       -0.01816       5.25477        0.620
(CONSTANT)   -83.51339

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.
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Note: There were no students who attended school B and took their first SAT in April '75. Also, all students in this subsample took their first PSAT on the same date, therefore the variable TIME9 (the number of months between PSAT and SAT) is not included. Similarly all students in this sample took only one PSAT prior to their first SAT, therefore the variable NEWNPSAT is also excluded.

A-1

Prediction of First Math SAT Score - Subsample 1

MULTIPLE REGRESSION — VARIABLE LIST 1, REGRESSION LIST 2

DEPENDENT VARIABLE.. SMATH1 MATH SCORE-FIRST EXAM

VARIABLE(S) ENTERED ON STEP NUMBER 1..

RANK	HIGH SCHOOL CLASS RANK
SEX1	SEX REPORTED AS FEMALE
TMAT	YEARS OF MATH
PSM1	PSAT MATH SCORE
RACE1	OTHER MINORITY ETHNICS
RACE2	BLACKS
INCOM	PARENTS INCOME LEVEL
HSTYP	PRIVATE HIGH SCHOOL
COACH1	SCHOOL MAN INTERCEPT
GMAT	LATEST MATH GRADE

MULTIPLE R	0.87979	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.77403	REGRESSION	10.	4510815.34451	451081.53445	159.28373
ADJUSTED R SQUARE	0.76918	RESIDUAL	465.	1316850.83196	2831.93727	
STANDARD ERROR	53.21595					

VARIABLES IN THE EQUATION

VARIABLE	B	BETA	STD ERROR B	F
RANK	0.8734410	0.13465	0.19372	20.329
SEX1	-7.794784	-0.03516	5.31961	2.155
TMAT	13.05651	0.08715	3.95985	10.872
PSM1	7.761498	0.70491	0.31756	597.367
RACE1	1.598865	0.00854	12.08609	0.145
RACE2	-20.42846	-0.02894	15.80302	1.671
INCOM	0.1403356	0.01182	0.27924	0.253
HSTYP	-6.377027	-0.03381	5.54688	2.281
COACH1	17.13654	0.04464	8.56584	3.964
GMAT	2.6302688	0.05075	0.36696	2.951
(CONSTANT)	-40.93016			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

See note on previous page.

A-12

Prediction of First Verbal SAT Score - Subsample 2

* MULTIPLE REGRESSION * * * * * * * * * * * * * *

VARIABLE LIST 1
REGRESSION LIST 1

DEPENDENT VARIABLE.. SVERB1 VERBAL SCORE -FIRST EXAM

VARIABLE(S) ENTERED ON STEP NUMBER 1.. PSV1 PSAT VERBAL SCORE

RANK	HIGH SCHOOL CLASS RANK
SEX1	SEX REPORTED AS FEMALE
GENG	LATEST ENGLISH GRADE
RACE1	OTHER MINORITY ETHNICS
RACE2	BLACKS
NEWNPSAT	TWO PSATS BEFORE SAT
TIME9	TIME BETWEEN PSAT AND SAT
INCOM	PARENTS INCOME LEVEL
HSTYP	PRIVATE HIGH SCHOOL
COACH1	SCHOOL "A" INTERCEPT
COACH2	SCHOOL "B" INTERCEPT
YENG	YEARS OF ENGLISH

		ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
MULTIPLE R	0.85601					
R SQUARE	0.73275	REGRESSION	13.	4682730.91703	360210.07054	135.61204
ADJUSTED R SQUARE	0.72734	RESIDUAL	643.	1707924.18191	2656.18069	
STANDARD ERROR	51.53815					

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	BETA	STD ERROR B	F
PSV1	7.270392	0.71149	0.24796	860.427
RANK	0.4739635	0.08830	0.14425	10.795
SEX1	4.723676	0.02391	4.31166	1.199
GENG	1.800558	0.12358	0.37137	23.508
RACE1	14.49998	0.03050	9.77778	2.172
RACE2	11.84600	0.01961	12.53247	0.893
NEWNPSAT	43.84311	0.05167	54.96171	0.636
TIME9	1.319187	0.01965	4.32906	0.093
INCOM	0.1934439	0.01917	0.21956	0.777
HSTYP	-7.942516	-0.03491	4.73301	2.816
COACH1	44.51202	0.16146	6.04269	54.258
COACH2	3.467302	0.01180	6.91272	0.252
YENG	2.865314	0.01205	4.95614	0.334
(CONSTANT)	-88.85651			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

A-3

Prediction of First Math SAT Score - Subsample 2

* MULTIPLE REGRESSION * * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 2

DEPENDENT VARIABLE.. SMATH1 MATH SCORE-FIRST EXAM

VARIABLE(S) ENTERED ON STEP NUMBER 1..

RANK	HIGH SCHOOL CLASS RANK
SEX1	SEX REPORTED AS FEMALE
TMAT	YEARS OF MATH
PSM1	PSAT MATH SCORE
RACE1	OTHER MINORITY ETHNICS
RACE2	BLACKS
NEWNPSAT	TWO PSATS BEFORE SAT
TIME9	TIME BETWEEN PSAT AND SAT
INCOM	PARENTS INCOME LEVEL
HSTYP	PRIVATE HIGH SCHOOL
COACH1	SCHOOL MAT INTERCEPT
COACH2	SCHOOL MEN INTERCEPT
GMAT	LATEST MATH GRADE

		ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
MULTIPLE R	0.86182					
R SQUARE	0.74274	REGRESSION	13.	5560732.95616	427748.68894	142.80162
ADJUSTED R SQUARE	0.73754	RESIDUAL	643.	1926045.43045	2995.40502	
STANDARD ERROR	54.73029					

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	BETA	STD ERROR B	F
RANK	0.4233244	0.07286	0.15277	7.679
SEX1	-9.589014	-0.03982	4.79056	3.155
TMAT	5.819039	0.04165	3.24820	2.887
PSM1	7.462360	0.70602	0.27485	737.134
RACE1	13.29157	0.02597	10.39962	1.631
RACE2	-6.944268	-0.01162	13.39841	0.269
NEWNPSAT	23.40575	0.02549	58.42473	0.160
TIME9	2.202589	0.03031	4.60686	0.229
INCOM	0.3841224	0.03516	0.23382	2.699
HSTYP	-1.844209	-0.00835	5.09026	0.131
COACH1	26.47609	0.08873	6.40389	17.093
COACH2	0.1948514	0.00061	7.33635	0.001
GMAT	1.452856	0.12012	0.31705	20.990
(CONSTANT)	-62.91187			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

A-4

Prediction of Second Verbal SAT Score - Subsample 3

MULTIPLE REGRESSION — VARIABLE LIST 1, REGRESSION LIST 1

DEPENDENT VARIABLE.. SVERB2 VERBAL SCORE-2ND EXAM

VARIABLE(S) ENTERED ON STEP NUMBER 1.. SVERB1 VERBAL SCORE -FIRST EXAM

RANK	HIGH SCHOOL CLASS RANK
SEX2	SEX REPORTED AS FEMALE
GENG	LATEST ENGLISH GRADE
RACE1	OTHER MINORITY ETHNICS
RACE2	BLACKS
TIME9	TIME BETWEEN SAT1 AND SAT2
INCOM	PARENTS INCOME LEVEL
HSTYP	PRIVATE HIGH SCHOOL
COACH1	SCHOOL "A" INTERCEPT
COACH2	SCHOOL "B" INTERCEPT
YENG	YEARS OF ENGLISH

MULTIPLE R	0.88271	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.77918	REGRESSION	12.	2760616.34285	231718.02857	101.74179
ADJUSTED R SQUARE	0.77152	RESIDUAL	346.	788018.75465	2277.51085	
STANDARD ERROR	47.72327					

VARIABLES IN THE EQUATION

VARIABLE	B	BETA	STD ERROR B	F
SVERB1	0.8649131	0.82239	0.03237	713.795
RANK	0.2113193	0.03546	0.18214	1.346
SEX2	-9.614226	-0.04813	5.29314	3.299
GENG	0.8024422	0.05634	0.45215	3.151
RACE1	-3.836537	-0.00862	11.60620	0.109
RACE2	-0.7253709	-0.00125	15.07270	0.002
TIME9	3.283585	0.03290	2.56779	1.635
INCOM	-0.1464644	-0.01363	0.28348	0.267
HSTYP	-5.666619	-0.02556	5.85648	0.936
COACH1	26.87222	0.09009	7.85741	11.696
COACH2	0.4854659	0.00103	12.63951	0.001
YENG	0.3513492D-01	0.00013	7.27974	0.000
(CONSTANT)	-29.68381			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

A-5

Prediction of Second Math SAT Score - Subsample 3

* MULTIPLE REGRESSION * * * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 2

DEPENDENT VARIABLE.. SMATH2 MATH SCORE-2ND EXAM

VARIABLE(S) ENTERED ON STEP NUMBER 1.. RANK HIGH SCHOOL CLASS RANK

SEX2	SEX REPORTED AS FEMALE
SMATH1	MATH SCORE-FIRST EXAM
YMAT	YEARS OF MATH
RACE1	OTHER MINORITY ETHNICS
RACE2	BLACKS
TIME9	TIME BETWEEN SAT1 AND SAT2
INCOM	PARENTS INCOME LEVEL
HSTYP	PRIVATE HIGH SCHOOL
COACH1	SCHOOL "A" INTERCEPT
COACH2	SCHOOL "B" INTERCEPT
GMAT	LATEST MATH GRADE

		ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
MULTIPLE R	0.87654					
R SQUARE	0.76832	REGRESSION	12.	3280612.54402	273384.41200	95.62152
ADJUSTED R SQUARE	0.76629	RESIDUAL	346.	989218.81085	2859.01399	
STANDARD ERROR	53.46975					

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	BETA	STD ERROR B	F
RANK	0.3257632	0.04987	0.23306	1.954
SEX2	-11.27637	-0.05161	6.25191	3.253
SMATH1	0.8491362	0.77849	0.03695	475.354
YMAT	10.69938	0.07506	4.55587	5.515
RACE1	5.784112	0.01188	12.96047	0.199
RACE2	-22.35466	-0.03535	16.71075	1.747
TIME9	1.925864	0.01764	2.89004	0.444
INCOM	-0.69323350-01	-0.00590	0.31725	0.048
HSTYP	-3.177526	-0.01310	6.58008	0.233
COACH1	22.44853	0.06680	8.79485	6.515
COACH2	27.93988	0.05441	13.63793	4.077
GMAT	0.1688944	0.01392	0.44954	0.141
(CONSTANT)	2.274463			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

A-6

Prediction of Second Verbal SAT Score - Subsample 4

MULTIPLE REGRESSION — VARIABLE LIST 1, REGRESSION LIST 1

DEPENDENT VARIABLE.. SVERB2 VERBAL SCORE-2ND EXAM

VARIABLE(S) ENTERED ON STEP NUMBER 1.. SVERB1 VERBAL SCORE -FIRST EXAM

RANK	HIGH SCHOOL CLASS RANK
SEX2	SEX REPORTED AS FEMALE
GENG	LATEST ENGLISH GRADE
RACE1	OTHER MINORITY ETHNICS
RACE2	BLACKS
TIME9	TIME BETWEEN SAT1 AND SAT2
INCOM	PARENTS INCOME LEVEL
HSTYP	PRIVATE HIGH SCHOOL
COACH1	SCHOOL "A" INTERCEPT
COACH2	SCHOOL "B" INTERCEPT
YENG	YEARS OF ENGLISH

		ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
MULTIPLE R	0.88075					
R SQUARE	0.77572	REGRESSION	12.	3169399.08581	264116.59048	122.49601
ADJUSTED R SQUARE	0.76939	RESIDUAL	425.	916352.74068	2156.12419	
STANDARD ERROR	46.43408					

VARIABLES IN THE EQUATION

VARIABLE	B	BETA	STD ERROR B	F
SVERB1	0.8627510	0.81193	0.02916	875.582
RANK	0.3761971	0.07160	0.15978	5.544
SEX2	-2.311057	-0.01193	4.70509	0.241
GENG	0.4339098	0.02833	0.44170	0.950
RACE1	-4.758227	-0.00857	12.80703	0.135
RACE2	-37.17650	-0.06532	13.32974	7.778
TIME9	-0.4189916	-0.00566	1.75664	0.057
INCOM	0.1820663	0.01038	0.23828	0.183
HSTYP	12.51606	0.06032	5.07555	6.081
COACH1	25.42568	0.11711	5.49019	21.447
COACH2	9.441843	0.02273	10.44512	0.821
YENG	7.494130	0.03322	5.20793	2.065
(CONSTANT)	-20.60938			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

A-7

Prediction of Second Math SAT Score - Subsample 4

* MULTIPLE REGRESSION * * * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 2

DEPENDENT VARIABLE.. SMATH2 MATH SCORE-2ND EXAM

VARIABLE(S) ENTERED ON STEP NUMBER 1.. RANK HIGH SCHOOL CLASS RANK

SEX2	SEX REPORTED AS FEMALE
SMATH1	MATH SCORE-FIRST EXAM
YRAT	YEARS OF MATH
RACE1	OTHER MINORITY ETHNICS
RACE2	BLACKS
TIME9	TIME BETWEEN SAT1 AND SAT2
INCOM	PARENTS INCOME LEVEL
HSTYP	PRIVATE HIGH SCHOOL
COACH1	SCHOOL MAP INTERCEPT
COACH2	SCHOOL PPM INTERCEPT
GMAT	LATEST MATH GRADE

		ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
MULTIPLE R	0.90699					
R SQUARE	0.82264	REGRESSION	12.	4677913.55499	389826.12958	164.26970
ADJUSTED R SQUARE	0.81763	RESIDUAL	425.	1008561.55917	2373.08602	
STANDARD ERROR	48.71433					

VARIABLES IN THE EQUATION

VARIABLE	B	BETA	STD ERROR B	F
RANK	0.4673554	0.07540	0.17060	7.505
SEX2	-11.43170	-0.04388	5.10088	4.996
SMATH1	0.8443958	0.78818	0.03069	830.484
YRAT	8.428966	1.06481	3.04470	7.479
RACE1	-2.571573	-0.00397	13.49086	0.036
RACE2	-11.86061	-0.01767	14.25314	0.692
TIME9	-1.365120	-0.01563	1.85374	0.542
INCOM	0.2221381	0.01914	0.25076	7.785
HSTYP	-11.44009	-0.04673	5.45230	4.403
COACH1	30.49881	0.11574	5.72739	28.739
COACH2	1.993002	0.00405	10.94860	0.033
GMAT	0.1021335	0.01401	0.35399	0.265
(CONSTANT)	5.674906			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

A-18

Prediction of First Verbal SAT Score - Subsample 5

* M U L T I P L E R E G R E S S I O N * * * * * * * * * * * * * *

VARIABLE LIST 1
REGRESSION LIST 1

DEPENDENT VARIABLE.. SVERB1 VERBAL SCORE -FIRST EXAM

VARIABLE(S) ENTERED ON STEP NUMBER 1.. PSV1 PSAT VERBAL SCORE

RANK	HIGH SCHOOL CLASS RANK
SEX1	SEX REPORTED AS FEMALE
GENG	LATEST ENGLISH GRADE
TIME10	NO. OF MONTHS FROM FIRST RECORD TO SAT
RACE1	OTHER MINORITY ETHNICS
RACE2	BLACKS
NEWNPSAT	TWO PSATS BEFORE SAT
TIME9	TIME BETWEEN PSAT AND SAT
INCOM	PARENTS INCOME LEVEL
HSTYP	PRIVATE HIGH SCHOOL
COACH1	SCHOOL "A" INTERCEPT
COACH2	SCHOOL "B" INTERCEPT
SOPH	SOPHOMORES
JUNIOR	JUNIORS
YENG	YEARS OF ENGLISH

MULTIPLE R	0.86291	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.74462	REGRESSION	16.	12371275.01869	773204.68867	284.46[illegible]
ADJUSTED R SQUARE	0.74200	RESIDUAL	1561.	4242947.35140	2718.09568	
STANDARD ERROR	52.13536					

VARIABLES IN THE EQUATION

VARIABLE	B	BETA	STD ERROR B	F
PSV1	7.724141	0.75307	0.16042	2318.458
RANK	0.4381[illegible]	0.07534	0.09602	20.824
SEX1	3.525233	0.01714	2.74404	1.651
GENG	1.558131	0.10508	0.23528	43.634
TIME10	0.5[illegible]120-01	0.00353	0.21280	0.007
RACE1	[illegible].05[illegible]426	0.01731	6.06569	1.761
RACE2	4.17[illegible]53	0.00772	7.21402	0.335
NEWNPSAT	41.67276	0.05267	14.42213	8.349
TIME9	0.3858709	0.00959	0.98373	0.154
INCOM	0.5042123	0.04921	0.14401	12.258
HSTYP	-5.914763	-0.02721	3.02165	3.832
COACH1	25.68366	0.09174	4.38956	45.750
COACH2	-1.769640	-0.00437	5.71260	0.096
SOPH	-28.23504	-0.02070	19.54635	2.082
JUNIOR	-0.1821490	-0.00048	8.19174	0.000
YENG	-2.192242	-0.00943	3.00932	0.530
(CONSTANT)	-42.68563			

ALL VARIABLES ARE IN THE EQUATION

A-9

Prediction of First Math SAT Score - Subsample 5

* M U L T I P L E R E G R E S S I O N * * * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 2

DEPENDENT VARIABLE.. SMATH1 MATH SCORE-FIRST EXAM

VARIABLE(S) ENTERED ON STEP NUMBER 1..

RANK	HIGH SCHOOL CLASS RANK
SEX1	SEX REPORTED AS FEMALE
TIME10	NO. OF MONTHS FROM FIRST RECORD TO SAT
PSM1	PSAT MATH SCORE
RACE1	OTHER MINORITY ETHNICS
RACE2	BLACKS
NEWNPSAT	TWO PSATS BEFORE SAT
TIME9	TIME BETWEEN PSAT AND SAT
INCOM	PARENTS INCOME LEVEL
HSTYP	PRIVATE HIGH SCHOOL
COACH1	SCHOOL "A" INTERCEPT
COACH2	SCHOOL "B" INTERCEPT
SOPH	SOPHOMORES
JUNIOR	JUNIORS
GMAT	LATEST MATH GRADE
YMAT	YEARS OF MATH

MULTIPLE R	0.87971	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.77388	REGRESSION	16.	1524873[illegible].15682	953045.69736	333.91303
ADJUSTED R SQUARE	0.77157	RESIDUAL	1561.	4455404.71137	2854.19905	
STANDARD ERROR	53.42470					

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	BETA	STD ERROR B	F
RANK	0.55508887	0.08764	0.12000	30.812
SEX1	-4.991016	-0.03103	2.93604	5.605
TIME10	-0.1065837	-0.00429	0.21826	0.238
PSM1	7.719163	0.71913	0.17298	1991.442
RACE1	8.60346460E-01	0.00012	6.20313	0.000
RACE2	-21.55445	-0.03659	7.39533	8.495
NEWNPSAT	41.33219	0.04796	14.82366	7.774
TIME9	-0.7881190	-0.01799	1.00834	0.611
INCOM	0.2818682	0.02474	0.14799	3.627
HSTYP	-7.819438	-0.03363	3.10606	6.338
COACH1	19.21124	0.05452	4.49997	18.226
COACH2	5.385424	0.01222	5.84993	0.847
SOPH	-2.340513	-0.00158	19.95224	0.014
JUNIOR	-12.18402	-0.02934	8.41989	2.094
GMAT	1.079393	0.08895	0.19154	31.756
YMAT	10.01148	0.07145	2.04280	24.018
(CONSTANT)	-29.41731			

ALL VARIABLES ARE IN THE EQUATION

A-10

Prediction of Second Verbal SAT Score - Subsample 6

* MULTIPLE REGRESSION * * * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 1

DEPENDENT VARIABLE.. SVERB2 VERBAL SCORE-2ND EXAM

VARIABLE(S) ENTERED ON STEP NUMBER 1..

SVERB1	VERBAL SCORE -FIRST EXAM
RANK	HIGH SCHOOL CLASS RANK
SEX2	SEX REPORTED AS FEMALE
GENG	LATEST ENGLISH GRADE
TIME10	NO. OF MONTHS FROM FIRST RECORD TO SAT2
RACE1	OTHER MINORITY ETHNICS
RACE2	BLACKS
TIME9	TIME BETWEEN SAT1 AND SAT2
INCOM	PARENTS INCOME LEVEL
HSTYP	PRIVATE HIGH SCHOOL
COACH1	SCHOOL "A" INTERCEPT
COACH2	SCHOOL "B" INTERCEPT
JUNIOR	JUNIORS
YENG	YEARS OF ENGLISH

		ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
MULTIPLE R	0.88012					
R SQUARE	0.77460	REGRESSION	14.	9113408.23144	650957.73082	284.99427
ADJUSTED R SQUARE	0.77189	RESIDUAL	1161.	2651846.57128	2284.10730	
STANDARD ERROR	47.79234					

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	BETA	STD ERROR B	F
SVERB1	0.8576765	0.81246	0.01772	2343.121
RANK	0.3195265	0.05680	0.09885	10.448
SEX2	-5.737335	-0.02858	2.88323	3.960
GENG	0.5879402	0.03982	0.25503	5.299
TIME10	0.3070251	0.02330	0.20128	2.327
RACE1	-1.944060	-0.00386	6.76805	0.074
RACE2	-15.43995	-0.02961	7.44162	4.305
TIME9	1.918257	0.03964	0.91024	4.441
INCOM	0.1145621	0.01111	0.15282	0.562
HSTYP	4.198710	0.01929	3.15230	1.766
COACH1	27.19838	0.09678	4.12510	43.473
COACH2	5.520378	0.01124	7.19435	0.589
JUNIOR	16.93809	0.05856	5.68916	8.833
YENG	1.033942	0.00401	3.50940	0.082
(CONSTANT)	-23.12545			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

A-11

Prediction of Second Math SAT Score - Subsample 6

* MULTIPLE REGRESSION * * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 2

DEPENDENT VARIABLE.. SMATH2 MATH SCORE-2ND EXAM

VARIABLE(S) ENTERED ON STEP NUMBER 1.. RANK HIGH SCHOOL CLASS RANK

SEX2	SEX REPORTED AS FEMALE
TIME10	NO. OF MONTHS FROM FIRST RECORD TO SAT2
SMATH1	MATH SCORE-FIRST EXAM
RACE1	OTHER MINORITY ETHNICS
RACE2	BLACKS
TIME8	TIME BETWEEN SAT1 AND SAT2
INCOM	PARENTS INCOME LEVEL
HSTYP	PRIVATE HIGH SCHOOL
COACH1	SCHOOL "A" INTERCEPT
COACH2	SCHOOL "B" INTERCEPT
JUNIOR	JUNIORS
GMAT	LATEST MATH GRADE
YMAT	YEARS OF MATH

MULTIPLE R	0.89362	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.79855	REGRESSION	14.	11872571.48491	848040.82035	328.73665
ADJUSTED R SQUARE	0.79612	RESIDUAL	1161.	2995027.74978	2579.69660	
STANDARD ERROR	50.79071					

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	BETA	STD ERROR B	F
RANK	0.4887339	0.07602	0.11948	16.737
SEX2	-11.53601	-0.05111	3.21237	12.896
TIME10	0.3114368	0.02103	0.21423	2.113
SMATH1	0.8384572	0.78748	0.01899	1949.897
RACE1	12.26792	0.02264	7.18665	2.914
RACE2	-13.37210	-0.03270	7.98060	2.792
TIME8	.2110816	0.00390	0.96832	0.048
INCOM	0.1524753	0.01298	0.16210	0.862
HSTYP	-4.997484	-0.02047	3.35976	2.212
COACH1	28.43238	0.09000	4.38631	42.017
COACH2	3.021484	0.00547	7.65068	0.156
JUNIOR	-0.8770878	-0.00270	6.07690	0.021
GMAT	0.2487349	0.01994	0.21965	1.282
YMAT	7.650507	0.05325	2.28019	11.257
(CONSTANT)	5.913195			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

A-12

APPENDIX B

Regressions Used to Estimate Expected PSAT (Sub-sample 5) and 1st SAT (Sub-sample 6) Scores

Prediction of First Verbal PSAT Score - Subsample 5

MULTIPLE REGRESSION — VARIABLE LIST 1, REGRESSION LIST 1

DEPENDENT VARIABLE.. PSV1 PSAT VERBAL SCORE

VARIABLE(S) ENTERED ON STEP NUMBER 1.. TIME10 NO. OF MONTHS FROM FIRST RECORD TO PSAT

RANK	HIGH SCHOOL CLASS RANK
SEX1	SEX REPORTED AS FEMALE
GENG	LATEST ENGLISH GRADE
RACE1	OTHER MINORITY ETHNICS
RACE2	BLACKS
INCOM	PARENTS INCOME LEVEL
HSTYP	PRIVATE HIGH SCHOOL
YENG	YEARS OF ENGLISH

MULTIPLE R	0.[illegible]578
R SQUARE	0.3[illegible]689
ADJUSTED R SQUARE	0.3[illegible]682
STANDARD ERROR	8.24311

ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
REGRESSION	8.	48761.20368	5420.13374	77.86711
RESIDUAL	1566.	109144.54853	69.66744	

VARIABLES IN THE EQUATION

VARIABLE	B	BETA	STD ERROR B	F
TIME10	0.9871[illegible]670-01	[illegible].04513	0.03216	9.422
RANK	0.2029[illegible]764	[illegible].35629	0.01436	198.015
SEX1	-2.831[illegible]781	-[illegible].14123	0.42965	43.443
GENG	0.2889[illegible]285	[illegible].20930	0.03675	61.776
RACE1	-2.67[illegible]920	-[illegible].05892	0.96331	7.686
RACE2	-5.67[illegible]412	-[illegible].10768	1.13012	25.243
INCOM	0.578[illegible]840-01	[illegible].09400	0.00223	19.388
HSTYP	1.07[illegible]923	[illegible].05973	0.45363	5.616
YENG	0.9211673	[illegible].04067	0.47814	3.711
(CONSTANT)	-2.12[illegible]320			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

B-1

* MULTIPLE REGR

DEPENDENT VARIABLE.. PSM1 PSAT MATH SCORE

VARIABLE(S) ENTERED ON STEP NUMBER 1.. RANK HIGH SCHOOL CLASS
SEX1 SEX REPORTED AS FE
TIME10 NO. OF MONTHS FROM
RACE1 OTHER MINORITY ETH
RACE2 BLACKS
INCOM PARENTS INCOME LEV
HSTYP PRIVATE HIGH SCHOO
GMAT LATEST MATH GRADE
YMAT YEARS OF MATH

MULTIPLE R	0.65393	ANALYSIS OF VARIANCE
R SQUARE	0.42762	REGRESSION
ADJUSTED R SQUARE	0.42433	RESIDUAL 19
STANDARD ERROR	7.90109	

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	BETA	STD ERROR B	F
RANK	0.176[illegible]97	0.25997	0.01396	160.665
SEX1	-4.247322	-0.22255	0.41618	104.152
TIME10	0.[illegible]160-01	0.05236	0.03058	7.306
RACE1	-0.[illegible]	-0.01171	0.91177	0.367
RACE2	-5.539115	-0.13787	1.07068	26.727
INCOM	0.1957231	0.09963	0.03101	25.194
HSTYP	-1.174798	-0.09350	0.43112	7.489
GMAT	0.193[illegible]579	0.17077	0.02764	48.797
YMAT	2.[illegible]68	0.21845	0.29119	95.900
(CONSTANT)	6.901079			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

SAT Score - Subsample 5

E S S I O N . . . . . VARIABLE LIST 1
REGRESSION LIST 2

RANK
MALE
FIRST RECORD TO PSAT
MICS

FL
OL

DF	SUM OF SQUARES	MEAN SQUARE	F
6.	73129.17019	8125.46335	130.15455
68.	97885.50205	62.42723	

B-2

* MULTIPLE RE

DEPENDENT VARIABLE.. SVER61 VERBAL SCORE -FIRST EXAM

VARIABLE(S) ENTERED ON STEP NUMBER 1.. TIME/O NO. OF MONTHS F
RANK HIGH SCHOOL CLA
SEX2 SEX REPORTED AS
GENG LATEST ENGLISH
RACE1 OTHER MINORITY
RACE2 BLACKS
INCOM PARENTS INCOME
HSTYP PRIVATE HIGH SC
YENG YEARS OF ENGLIS

MULTIPLE R	0.55403
R SQUARE	0.30695
ADJUSTED R SQUARE	0.30160
STANDARD ERROR	79.21572

ANALYSIS OF VARIANCE
REGRESSION
RESIDUAL

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	BETA	STD ERROR B	F
TIME/O	0.2204418	0.01674	0.5218	0.471
RANK	1.778634	0.33374	0.15394	133.482
SEX2	-11.38402	-0.05987	4.74775	5.752
GENG	9.529866	0.25245	0.49731	74.934
RACE1	-22.8[illegible]	-0.05438	11.16560	4.172
RACE2	-35.5[illegible]	-0.07261	12.25937	8.416
INCOM	1.201423	0.13236	0.24426	28.041
HSTYP	8.278956	0.04300	5.07437	2.630
YENG	10.34191	0.04367	5.79955	3.180
(CONSTANT)	-68.74863			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

SAT Score - Subsample 6

G R E S S I O N . . . . . VARIABLE LIST 1
REGRESSION LIST 1

POM FIRST RECORD TO SAT1
SS RANK
FEMALE
CRACE
ETHNICS

LEVEL
HOOL
M

DF	SUM OF SQUARES	MEAN SQUARE	F
9.	3240521.09618	360057.89958	57.47456
1166.	7316801.35280	6275.12981	

B-3

Prediction of First Math SAT Score - Subsample 6

```
. . . . . MULTIPLE REGRESSION . . . . .    VARIABLE LIST   1
                                           REGRESSION LIST  2

DEPENDENT VARIABLE..    SMATH1     MATH SCORE-FIRST EXAM

VARIABLE(S) ENTERED ON STEP NUMBER  1..   RANK      HIGH SCHOOL CLASS RANK
                                          SEX2      SEX REPORTED AS FEMALE
                                          TIME10    NO. OF MONTHS FROM FIRST RECORD TO SAT1
                                          RACE1     OTHER MINORITY ETHNICS
                                          RACE2     BLACKS
                                          INCOM     PARENTS INCOME LEVEL
                                          HSTYP     PRIVATE HIGH SCHOOL
                                          GMAT      LATEST MATH GRADE
                                          TMAT      YEARS OF MATH

MULTIPLE R            0.64714        ANALYSIS OF VARIANCE    DF      SUM OF SQUARES      MEAN SQUARE          F
R SQUARE              0.41880        REGRESSION               9.      5777934.48199      641992.72022      103.91 75
ADJUSTED R SQUARE     0.41479        RESIDUAL              1166.      7203968.29012        6178.30904
STANDARD ERROR       78.61222

---------- VARIABLES IN THE EQUATION ----------

VARIABLE          B          BETA      STD ERROR B          F

RANK          1.727752       .29937        0.15857       118.120
SEX2        -36.45561      -.17286         4.83639        56.818
TIME10       -.4709141      -.03221         0.31934         2.174
RACE1      -13.47893      -.02685        11.08068         1.480
RACE2      -57.25963      -.10455        12.17084        22.134
INCOM        1.882751       .09092         0.24362        19.851
HSTYP      -11.15159      -.04898         5.05931         4.860
GMAT         2.642272       .22670         0.32675        65.393
TMAT        33.17655       1.22477         3.40670        78.464
(CONSTANT)  24.20926

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.
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B-4

APPENDIX C

Regression Analyses to Measure the Effect of Coaching Adjusting for Self-Selection

Prediction of First Verbal SAT Score - Subsample 1

```
. . . . . MULTIPLE REGRESSION . . . . .          VARIABLE LIST   1
                                                 REGRESSION LIST 1

DEPENDENT VARIABLE..   SVERB1    VERBAL SCORE -FIRST EXAM

VARIABLE(S) ENTERED ON STEP NUMBER  1..   RANK     HIGH SCHOOL CLASS RANK
                                          SEX1     SEX REPORTED AS FEMALE
                                          GENG     LATEST ENGLISH GRADE
                                          RACE1    OTHER MINORITY ETHNICS
                                          RACE2    BLACKS
                                          INCOM    PARENTS INCOME LEVEL
                                          HSTYP    PRIVATE HIGH SCHOOL
                                          COACH1   SCHOOL "A" INTERCEPT
                                          YENG     YEARS OF ENGLISH

MULTIPLE R            0.60433     ANALYSIS OF VARIANCE    DF      SUM OF SQUARES      MEAN SQUARE          F
R SQUARE              0.36521     REGRESSION               9.    1717756.30301     190861.81145     29.78956
ADJUSTED R SQUARE     0.35295     RESIDUAL               466.    2985665.54573       6407.00761
STANDARD ERROR       80.04379

---------- VARIABLES IN THE EQUATION ----------

VARIABLE            B          BETA      STD ERROR B          F

RANK          2.062732       0.35397         0.25943     63.217
SEX1        -13.632160      -0.06845         7.49492      3.308
GENG          4.404571       0.32218         0.61830     50.746
RACE1       -33.066998      -0.06832        18.27594      3.274
RACE2         1.662561       0.00262        23.75784      0.005
INCOM         0.9531088      0.08933         0.41887      5.175
HSTYP         9.223566       0.04144         8.35626      1.218
COACH1       -6.075156      -0.01840        12.79734      0.225
YENG          2.736923       0.01202         8.53619      0.103
(CONSTANT)  -116.6626

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.
```

Note: PSV1 excluded from predicting equation.

There were no students who attended school B and took their first SAT in April '75. Also, all students in this subsample took their first PSAT on the same date, therefore the variable TIME9 (the number of months between PSAT and SAT) is not included. Similarly all students in this sample took only one PSAT prior to their first SAT, therefore the variable NEWNPSAT is also excluded.

C-1

Prediction of First Math SAT Score - Subsample 1

* MULTIPLE REGRESSION * * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 2

DEPENDENT VARIABLE.. SMATH1 MATH SCORE-FIRST EXAM

VARIABLE(S) ENTERED ON STEP NUMBER 1..

RANK	HIGH SCHOOL CLASS RANK
SEX1	SEX REPORTED AS FEMALE
TMAT	YEARS OF MATH
RACE1	OTHER MINORITY ETHNICS
RACE2	BLACKS
INCOM	PARENTS INCOME LEVEL
HSTYP	PRIVATE HIGH SCHOOL
COACH1	SCHOOL "A" INTERCEPT
GMAT	LATEST MATH GRADE

MULTIPLE R	0.69552
R SQUARE	0.48375
ADJUSTED R SQUARE	0.47378
STANDARD ERROR	80.35006

ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
REGRESSION	9.	2619108.25666	313234.25074	48.51732
RESIDUAL	466.	3008557.91981	6456.13288	

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	BETA	STD ERROR B	F
RANK	2.590748	0.39941	0.27258	90.339
SEX1	-39.99422	-0.18041	7.76621	26.520
TMAT	31.92611	0.21310	5.86418	29.640
RACE1	-0.2509841	-0.00158	18.24552	0.002
RACE2	-37.67683	-0.05337	23.83698	2.498
INCOM	0.7472797	0.06292	0.41995	3.166
HSTYP	-16.98034	-0.06854	8.35829	4.127
COACH1	-1.402659	-0.00382	12.91296	0.012
GMAT	2.123123	0.17092	0.54634	15.102
(CONSTANT)	6.695174			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

Note: ~~PSM1 excluded from predicting equation.~~

See note on previous page.

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Prediction of First Verbal SAT Score - Subsample 2

* MULTIPLE REGRESSION * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 1

DEPENDENT VARIABLE.. SVERB1 VERBAL SCORE -FIRST EXAM

VARIABLE(S) ENTERED ON STEP NUMBER 1.. RANK HIGH SCHOOL CLASS RANK
SEX1 SEX REPORTED AS FEMALE
GENG LATEST ENGLISH GRADE
RACE1 OTHER MINORITY ETHNICS
RACE2 BLACKS
NEWNPSAT TWO PSATS BEFORE SAT
TIME9 TIME BETWEEN PSAT AND SAT
INCOM PARENTS INCOME LEVEL
HSTYP PRIVATE HIGH SCHOOL
COACH1 SCHOOL "A" INTERCEPT
COACH2 SCHOOL "B" INTERCEPT
YENG YEARS OF ENGLISH

MULTIPLE R	0.61230	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.37491	REGRESSION	12.	2396128.80488	199677.40041	32.23801
ADJUSTED R SQUARE	0.36328	RESIDUAL	645.	3995033.65713	6193.85063	
STANDARD ERROR	78.70102					

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	BETA	STD ERROR B	F
RANK	1.944416	0.36257	0.20646	88.699
SEX1	-15.06353	-0.09156	6.47317	7.797
GENG	3.770422	0.25898	0.55746	45.713
RACE1	6.604462	0.01399	14.92558	0.196
RACE2	-15.23060	-0.02521	19.08553	0.637
NEWNPSAT	65.85506	0.07761	83.91946	0.616
TIME9	-1.155721	-0.01722	6.60939	0.031
INCOM	0.9229472	0.09154	0.33266	7.697
HSTYP	-1.799743	-0.02082	7.21978	0.062
COACH1	26.76874	0.09711	9.17536	8.512
COACH2	0.8377352	0.00285	10.55446	0.006
YENG	4.410904	0.01855	7.57078	0.339
(CONSTANT)	-47.29730			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

Note: PSV1 excluded from predicting equation.

C-3

Prediction of First Math SAT Score - Subsample 2

• MULTIPLE REGRESSION • • • • • • • • • • • • • VARIABLE LIST 1
REGRESSION LIST 2

DEPENDENT VARIABLE.. SMATH1 MATH SCORE-FIRST EXAM

VARIABLE(S) ENTERED ON STEP NUMBER 1.. RANK HIGH SCHOOL CLASS RANK
SEX1 SEX REPORTED AS FEMALE
TMAT YEARS OF MATH
RACE1 OTHER MINORITY ETHNICS
RACE2 BLACKS
NEWNPSAT TWO PSATS BEFORE SAT
TIME9 TIME BETWEEN PSAT AND SAT
INCOM PARENTS INCOME LEVEL
HSTYP PRIVATE HIGH SCHOOL
COACH1 SCHOOL "A" INTERCEPT
COACH2 SCHOOL "B" INTERCEPT
GMAT LATEST MATH GRADE

MULTIPLE R	0.66942	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.44812	REGRESSION	12.	3356887.52274	279740.62689	43.64524
ADJUSTED R SQUARE	0.43786	RESIDUAL	645.	4134074.93927	6409.41851	
STANDARD ERROR	80.05684					

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	BETA	STD ERROR B	F
RANK	1.556518	0.26706	0.21503	51.993
SEX1	-40.57089	-0.18994	6.78595	35.750
TMAT	27.64683	0.20962	4.59936	36.132
RACE1	13.49691	0.02639	15.21243	0.787
RACE2	-49.81683	-0.07616	19.46241	6.552
NEWNPSAT	80.64460	0.08779	85.40526	0.892
TIME9	-4.505576	-0.06199	6.72913	0.448
INCOM	1.195900	0.10956	0.33802	12.451
HSTYP	-13.14351	-0.05950	7.41993	3.138
COACH1	7.542413	0.02527	9.30653	0.657
COACH2	8.760993	0.02754	10.72091	0.668
GMAT	2.950890	0.24413	0.45662	41.763
(CONSTANT)	42.80624			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

Note: PSM1 excluded from predicting equation.

* MULTIPLE RE

DEPENDENT VARIABLE.. SVERB2 VERBAL SCORE-2ND EXAM

VARIABLE(S) ENTERED ON STEP NUMBER 1.. RANK HIGH SCHOOL CL

SEX2	SEX REPORTED A
GENG	LATEST ENGLISH
RACE1	OTHER MINORITY
RACE2	BLACKS
TIME9	TIME BETWEEN S
INCOM	PARENTS INCOME
HSTYP	PRIVATE HIGH S
COACH1	SCHOOL "A" INT
COACH2	SCHOOL "B" INT
YENG	YEARS OF ENGLI

MULTIPLE R	0.56889
R SQUARE	0.32364
ADJUSTED R SQUARE	0.30220
STANDARD ERROR	83.40201

ANALYSIS OF VARIANCE
REGRESSION
RESIDUAL

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	BETA	STD ERROR B	F
RANK	1.617445	0.27174	0.30467	28.253
SEX2	-17.63250	-0.08827	9.23550	3.645
GENG	4.836554	0.33947	0.74483	42.165
RACE1	-25.74614	-0.05781	20.23266	1.619
RACE2	-5.513951	-0.00953	26.33945	0.044
TIME9	5.758128	0.05769	4.48459	1.649
INCOM	1.223393	0.11389	0.48725	6.304
HSTYP	6.183879	0.02789	10.20549	0.367
COACH1	27.86587	0.09342	13.73160	4.118
COACH2	8.332364	0.01775	22.08305	0.142
YENG	8.106692	0.02923	12.71124	0.407
(CONSTANT)	-182.0717			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

Note: SVERB1 excluded from predicting equation.

SAT Score - Subsample 3

G R E S S I O N * * * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 1

ASS RANK
S FEMALE
GRADE
ETHNICS

AT1 AND SAT2
LEVEL
CHOOL
ERCEPT
ERCEPT
SH

DF	SUM OF SQUARES	MEAN SQUARE	F
11.	1154939.54820	104994.50438	15.09432
347.	2413695.54929	6955.89495	

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Prediction of Second Math SAT Score - Subsample 3

* * * \

Prediction of Second Verbal

* M U L T I P L E R

DEPENDENT VARIABLE.. SVERB2 VERBAL SCORE-2ND EXAM

VARIABLE(S) ENTERED ON STEP NUMBER 1.. RANK HIGH SCHOOL C

SEX2	SEX REPORTED
GENG	LATEST ENGLIS
RACE1	OTHER MINORIT
RACE2	BLACKS
TIME9	TIME BETWEEN
INCOM	PARENTS INCOM
HSTYP	PRIVATE HIGH
COACH1	SCHOOL "A" IN
COACH2	SCHOOL "B" IN
YENG	YEARS OF ENGL

MULTIPLE R	0.56005
R SQUARE	0.31366
ADJUSTED R SQUARE	0.29594
STANDARD ERROR	81.13364

ANALYSIS OF VARIANCE
REGRESSION
RESIDUAL

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	BETA	STD ERROR B	F
RANK	2.133253	0.49011	0.25991	65.424
SEX2	-11.65637	-0.06016	8.20260	2.019
GENG	2.587301	0.17323	0.76119	11.553
RACE1	-21.44531	-0.03724	22.35825	0.836
RACE2	-70.29419	-0.12350	23.20868	9.171
TIME9	-3.212196	-0.04339	3.06493	1.098
INCOM	0.8405462	0.08545	0.41405	4.121
HSTYP	9.240424	0.04453	8.86632	1.086
COACH1	10.30791	0.04586	9.55130	1.165
COACH2	-1.503416	-0.00361	18.23912	0.007
YENG	19.71159	0.08749	9.07106	4.722
(CONSTANT)	12.12544			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

Note: SVERB1 excluded from predicting equation.

SAT Score - Subsample 4

E G R E S S I O N * * * * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 1

LASS RANK
AS FEMALE
H GRADE
Y ETHNICS

SAT1 AND SAT2
C LEVEL
SCHOOL
TERCEPT
TERCEPT
ISH

	DF	SUM OF SQUARES	MEAN SQUARE	F
	11.	1281535.23669	116503.20334	17.69848
	426.	2804216.58980	6582.66805	

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Prediction of Second Math SAT Score - Subsample 4

* MULTIPLE REGRESSION * * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 2

DEPENDENT VARIABLE.. SMATH2 MATH SCORE-2ND EXAM

VARIABLE(S) ENTERED ON STEP NUMBER 1.. RANK HIGH SCHOOL CLASS RANK
SEX2 SEX REPORTED AS FEMALE
TMAT YEARS OF MATH
RACE1 OTHER MINORITY ETHNICS
RACE2 BLACKS
TIME9 TIME BETWEEN SAT1 AND SAT2
INCOM PARENTS INCOME LEVEL
HSTYP PRIVATE HIGH SCHOOL
COACH1 SCHOOL "A" INTERCEPT
COACH2 SCHOOL "B" INTERCEPT
GMAT LATEST MATH GRADE

MULTIPLE R	0.68997	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.47606	REGRESSION	11.	2707103.94805	246100.35891	35.18821
ADJUSTED R SQUARE	0.46253	RESIDUAL	426.	2979371.16611	6993.82903	
STANDARD ERROR	83.62912					

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	BETA	STD ERROR B	F
RANK	1.975590	0.31871	0.27875	50.229
SEX2	-46.73761	-0.20434	8.50048	30.192
TMAT	36.26029	0.24933	5.69702	40.510
RACE1	7.558289	0.01167	23.15224	0.107
RACE2	-90.58857	-0.13492	24.01507	14.229
TIME9	-1.666058	-0.01208	3.18231	0.274
INCOM	0.7554643	0.06513	0.42932	3.100
HSTYP	-21.82428	-0.08915	9.33963	5.460
COACH1	19.37199	0.07305	9.80918	3.900
COACH2	3.237258	0.00659	18.79592	0.030
GMAT	2.625747	0.20194	0.59001	19.806
(CONSTANT)	28.21557			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

Note: SMATH1 excluded from predicting equation.

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Prediction of First Ver

* M U L T I P L E

DEPENDENT VARIABLE.. SVERB1 VERBAL SCORE -FIRST EXAM

VARIABLE(S) ENTERED ON STEP NUMBER 1.. RANK HIGH SCHOO

SEX1	SEX (FEMAL
GENG	LATEST ENG
RACE1	OTHER MINO
RACE2	BLACKS
NEWNPSAT	TWO PSATS
TIME9	TIME BETWE
INCOM	PARENTS IN
HSTYP	PRIVATE HI
COACH1	SCHOOL "A"
COACH2	SCHOOL "B"
SOPH	SOPHOMORES
JUNIOR	JUNIORS
YEAG	YEARS OF E

MULTIPLE R	0.60274	ANALYSIS OF VARI
R SQUARE	0.36331	REGRESSION
ADJUSTED R SQUARE	0.35761	RESIDUAL
STANDARD ERROR	82.26749	

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	BETA	STD ERROR B	F
RANK	1.996206	0.34323	0.14265	195.817
SEX1	-19.37418	-0.09274	4.26624	19.949
GENG	3.875014	0.26206	0.36336	113.731
RACE1	-8.521408	-0.01833	9.54850	0.796
RACE2	-35.00271	-0.06438	11.90921	10.074
NEWNPSAT	68.31281	1.08621	22.48476	9.039
TIME9	-5.089962	-0.13151	1.51505	12.191
INCOM	1.375701	0.13152	0.22506	37.364
HSTYP	2.983166	0.00958	4.75994	0.191
COACH1	11.46264	0.03543	6.85394	2.799
COACH2	-2.32213	-0.00574	8.74485	0.071
SOPH	-11.73614	-0.01959	30.53862	0.144
JUNIOR	-19.59560	-0.05086	12.98150	2.267
YEAG	5.901952	0.02541	4.74067	1.550
(CONSTANT)	-29.68812			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

Note: PSV1 excluded from predicting equation.

bal SAT Score - Subsample 5

R E G R E S S I O N * * * * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 1

L LASS RANK
ED AS FEMALE
LISH GRADE
RITY ETHNICS

EFORE SAT
EN PSAT AND SAT
COME LEVEL
GH SCHOOL
INTERCEPT
INTERCEPT

NGLISH

ANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
	14.	6035933.36999	431138.09786	63.73331
	1563.	10578289.00010	6767.93922	

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Prediction of First Math SAT Score - Subsample 5

* MULTIPLE REGRESSION * * * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 2

DEPENDENT VARIABLE.. SMATH1 MATH SCORE-FIRST EXAM

VARIABLE(S) ENTERED ON STEP NUMBER 1.. RANK HIGH SCHOOL CLASS RANK

SEX1	SEX REPORTED AS FEMALE
TMAT	YEARS OF MATH
RACE1	OTHER MINORITY ETHNICS
RACE2	BLACKS
NEWNPSAT	TWO PSATS BEFORE SAT
TIME9	TIME BETWEEN PSAT AND SAT
INCOM	PARENTS INCOME LEVEL
HSTYP	PRIVATE HIGH SCHOOL
COACH1	SCHOOL "A" INTERCEPT
COACH2	SCHOOL "B" INTERCEPT
SOPH	SOPHOMORES
JUNIOR	JUNIORS
GMAT	LATEST MATH GRADE

		ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
MULTIPLE R	0.69639					
R SQUARE	0.48495	REGRESSION	14.	9555613.77560	682543.84111	105.17023
ADJUSTED R SQUARE	0.48034	RESIDUAL	1563.	10148522.09258	6492.97639	
STANDARD ERROR	80.57991					

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	BETA	STD ERROR B	F
RANK	1.059802	0.30943	0.14309	187.594
SEX1	-40.95267	-0.18249	4.27676	91.737
TMAT	31.41547	0.22421	2.99505	110.622
RACE1	-1.433905	-0.00323	9.34943	0.031
RACE2	-51.64879	-0.10466	11.07165	31.004
NEWNPSAT	51.67608	0.05997	22.30054	5.370
TIME9	-4.818933	-0.11001	1.44931	10.470
INCOM	1.223115	0.10738	0.22051	30.767
HSTYP	-18.27529	-0.07721	4.67071	15.318
COACH1	0.5458998	0.00155	6.71455	0.007
COACH2	13.35535	0.03031	8.55852	2.435
SOPH	7.414401	0.00550	39.09151	0.061
JUNIOR	-22.10677	-0.05323	12.66897	3.045
GMAT	2.575714	0.21225	0.28395	82.284
(CONSTANT)	60.69004			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

Note: PSM1 excluded from predicting equation.

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Prediction of Second Verbal SAT Score - Subsample 6

* MULTIPLE REGRESSION * * * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 1

DEPENDENT VARIABLE.. SVERB2 VERBAL SCORE-2ND EXAM

VARIABLE(S) ENTERED ON STEP NUMBER 1.. RANK HIGH SCHOOL CLASS RANK

SEX2	SEX REPORTED AS FEMALE
GENG	LATEST ENGLISH GRADE
TIME10	NO. OF MONTHS FROM FIRST RECORD TO SAT2
RACE1	OTHER MINORITY ETHNICS
RACE2	BLACKS
TIME9	TIME BETWEEN SAT1 AND SAT2
INCOM	PARENTS INCOME LEVEL
HSTYP	PRIVATE HIGH SCHOOL
COACH1	SCHOOL "A" INTERCEPT
COACH2	SCHOOL "B" INTERCEPT
JUNIOR	JUNIORS
YENG	YEARS OF ENGLISH

MULTIPLE R	0.56543	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.31971	REGRESSION	13.	3761468.28636	289343.71434	42.00728
ADJUSTED R SQUARE	0.31210	RESIDUAL	1162.	8003788.51636	6887.94192	
STANDARD ERROR	82.99363					

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	BETA	STD ERROR B	F
RANK	1.859192	0.33048	0.16254	130.842
SEX2	-16.34249	-0.08140	4.99239	10.716
GENG	3.690559	0.25031	0.42864	74.131
TIME10	0.5765303	0.04376	0.34940	2.723
RACE1	-20.81587	-0.04356	11.73331	3.147
RACE2	-46.02595	-0.08827	12.87605	12.777
TIME9	1.277413	0.02640	1.58050	0.653
INCOM	1.317060	0.12776	0.26184	25.335
HSTYP	12.57946	0.05792	5.46583	5.297
COACH1	16.24035	0.05779	7.15264	5.155
COACH2	-3.926189	-0.00800	12.48872	0.099
JUNIOR	5.972893	0.02069	9.87171	0.366
YENG	9.341960	0.03756	6.08689	2.356
(CONSTANT)	-85.38992			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

Note: SVERB1 excluded from predicting equation.

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Prediction of Second Math SAT Score - Subsample 6

* MULTIPLE REGRESSION * * * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 2

DEPENDENT VARIABLE.. SMATH2 MATH SCORE-2ND EXAM

VARIABLE(S) ENTERED ON STEP NUMBER 1..

RANK	HIGH SCHOOL CLASS RANK
SEX2	SEX REPORTED AS FEMALE
TIME10	NO. OF MONTHS FROM FIRST RECORD TO SAT2
RACE1	OTHER MINORITY ETHNICS
RACE2	BLACKS
TIME9	TIME BETWEEN SAT1 AND SAT2
INCOM	PARENTS INCOME LEVEL
HSTYP	PRIVATE HIGH SCHOOL
COACH1	SCHOOL "A" INTERCEPT
COACH2	SCHOOL "B" INTERCEPT
JUNIOR	JUNIORS
GMAT	LATEST MATH GRADE
TMAT	YEARS OF MATH

		ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
MULTIPLE R	0.67840					
R SQUARE	0.46022	REGRESSION	13.	6842428.25210	526340.63478	76.21119
ADJUSTED R SQUARE	0.45419	RESIDUAL	1162.	8025170.98260	6906.34336	
STANDARD ERROR	83.10441					

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	BETA	STD ERROR B	F
RANK	1.035727	0.30609	0.16912	131.010
SEX2	-42.72317	-0.18930	5.12752	69.424
TIME10	-0.8793440-01	-0.00594	0.35021	0.063
RACE1	1.341040	0.00250	11.75192	0.013
RACE2	-51.45233	-0.10519	12.90144	22.836
TIME9	-0.2559892	-0.00471	1.58429	0.026
INCOM	1.166945	0.10063	0.26254	19.756
HSTYP	-13.01475	-0.05331	5.48924	5.621
COACH1	16.64181	0.05268	7.16363	5.397
COACH2	-4.374129	-0.00792	12.51515	0.122
JUNIOR	-16.30531	-0.05024	9.92665	2.698
GMAT	2.570651	0.20609	0.34895	54.270
TMAT	32.77745	0.22813	3.61284	82.310
(CONSTANT)	23.74532			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

Note: SMATH1 excluded from predicting equation.

APPENDIX D

Regressions Used to Estimate Expected PSAT for Subsample 6

Prediction of First Math PSAT Score - Subsample 6

* MULTIPLE REGRESSION * * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 2

DEPENDENT VARIABLE.. PSM1

VARIABLE(S) ENTERED ON STEP NUMBER 1.. RANK HIGH SCHOOL CLASS RANK
SEX2 SEX REPORTED AS FEMALE
RACE1 OTHER MINORITY ETHNICS
RACE2 BLACKS
INCOM PARENTS INCOME LEVEL
HSTYP PRIVATE HIGH SCHOOL
TIME/O NO. OF MONTHS FROM FIRST RECORD TO PSAT
GMAT LATEST MATH GRADE
TMAT YEARS OF MATH

		ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
MULTIPLE R	0.62640					
R SQUARE	0.39240	REGRESSION	9.	38654.21925	4295.35769	68.69641
ADJUSTED R SQUARE	0.38677	RESIDUAL	957.	59838.02067	62.52667	
STANDARD ERROR	7.90738					

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	BETA	STD ERROR B	F
RANK	0.1864151	0.32431	0.01782	109.176
SEX2	-4.371511	-0.21267	0.53828	63.869
RACE1	-0.5633380D-01	-0.00114	1.26117	0.002
RACE2	-4.320090	-0.06924	1.59687	7.319
INCOM	0.1334568	0.09752	0.02733	14.329
HSTYP	-1.147256	-0.05273	0.55948	4.205
TIME/O	0.4637568D-01	0.02745	0.04241	1.177
GMAT	0.1834193	0.16570	0.03702	26.182
TMAT	2.524316	0.13517	0.37628	45.005
(CONSTANT)	7.721158			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

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Prediction of First Verbal PSAT Score - Subsample 6

* MULTIPLE REGRESSION * * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 1

DEPENDENT VARIABLE.. PSV1

VARIABLE(S) ENTERED ON STEP NUMBER 1.. RANK HIGH SCHOOL CLASS RANK
SEX2 SEX REPORTED AS FEMALE
GENG LATEST ENGLISH GRADE
RACE1 OTHER MINORITY ETHNICS
RACE2 BLACKS
INCOM PARENTS INCOME LEVEL
HSTYP PRIVATE HIGH SCHOOL
TIME10 NO. OF MONTHS FROM FIRST RECORD TO PSAT
YENG YEARS OF ENGLISH

MULTIPLE R	0.53147	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.28246	REGRESSION	9.	24124.40398	2680.49000	41.85936
ADJUSTED R SQUARE	0.27571	RESIDUAL	957.	61293.55486	64.03715	
STANDARD ERROR	8.00232					

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	BETA	STD ERROR B	F
RANK	-0.1913673	0.35566	0.01746	118.909
SEX2	-3.614074	-0.13878	0.52874	24.443
GENG	0.3016785	0.21270	0.04648	41.850
RACE1	-2.567557	-0.05569	1.27496	4.056
RACE2	-3.433525	-0.05917	1.61134	4.553
INCOM	0.8712626D-01	0.08900	0.02750	10.148
HSTYP	1.352917	0.06678	0.56331	5.768
TIME10	0.4567137D-01	0.02924	0.04265	1.134
YENG	1.582137	0.06966	0.62436	6.421
(CONSTANT)	-4.792967			

ALL VARIABLES ARE IN THE EQUATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

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ADDENDUM

"SCHOOL A" IN THIS STUDY IS THE STANLEY H. KAPLAN EDUCATIONAL CENTER, INC.

"SCHOOL B" IS THE TEST PREPARATION CENTER, INC.